

**WasteCap of Massachusetts Site Visit Report:
Massachusetts Water Resources Authority
100 First Avenue, Charlestown**

Developed by WasteCap of Massachusetts
for the Massachusetts Water Resources Authority

Site Visit Conducted on May 22, 2003

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INTRODUCTION AND BACKGROUND

WasteCap of Massachusetts contracted with the State Sustainability Program at the Massachusetts Executive Office of Environmental Affairs and the Department of Environmental Protection to perform a site visit for the following facility:

Massachusetts Water Resources Authority
100 First Avenue
Charlestown, MA 02129

Contact:
Charles Coppola, Manager Administrative Services

Site visit date:
May 22, 2003

The purpose of the site visit was to review the MWRA's current waste management practices and identify specific ways to reduce waste, improve environmental performance, and cut costs.

Facility Information

The 15 acre MWRA Chelsea facility contains two buildings-- an administration building (2 floors, 124,00 sq ft) and a maintenance building (92,000 sq ft). The facility is two years old and consists of 600 employees.

General Benefits of Recycling

Recycling turns materials that would otherwise become waste into valuable resources and generates a host of environmental, financial, and social benefits. Major benefits include:

- **Cost Savings**

Recycling saves money by diverting materials from the trash, thereby reducing trash collection and disposal fees.

The price per ton to divert recyclables like paper, cardboard, and scrap metal is usually less than it is for conventional trash disposal in landfills or incinerators.

- **Comply with Regulations and Executive Orders**

There are a number of regulations and an executive order relating to waste management procedures that state agencies should be in compliance with.

- **Waste Bans -**

"Waste bans" are restrictions on the disposal and transfer for disposal of certain hazardous and recyclable items at solid waste facilities in Massachusetts. Banned materials include paper; cardboard; glass, metal, and plastic containers; leaves and yard waste; batteries; white goods (appliances); whole tires; and cathode ray tubes. For more information visit

<http://www.state.ma.us/dep/recycle/files/wstban01.doc>

- **Massachusetts Universal Waste Rule -**

Universal wastes are specific hazardous wastes such as batteries, mercury containing products like thermostats and fluorescent lamps, and other materials that are commonly generated by households, businesses, and industries that are subject to streamlined regulations. Universal wastes must be stored in a separate area marked as a Universal Waste accumulation area. Containers of universal wastes or individual universal waste items must be labeled as Universal Waste, with the name of the waste, *e.g.*, Universal Wastes - Thermostats. Additional handling requirements depend on the type of waste. Disposal of universal wastes as solid waste is prohibited. Generators also are prohibited from accumulating universal wastes for longer than one

year, unless the generator can prove that the activity is solely for the purpose of accumulation of such quantities of universal waste as necessary to facilitate proper recovery, treatment or disposal by a licensed vendor.

For more information visit <http://www.state.ma.us/dep/recycle/files/univrul.doc>

- State Sustainability Executive Order No.438 - Executive Order 438, issued in July of 2002, calls on all state agencies to establish sustainability goals, initiate long-term sustainability planning, and implement sustainable practices at state facilities. The Order establishes a State Sustainability Program, staffed at the Executive Office of Environmental Affairs, which assists agencies in meeting the goals of the Order, including agency plans, environmental initiatives, and tracking and reporting.


With regard to solid waste, the Order calls on agencies to meet the 70% waste reduction goal established by the EOEA/DEP Beyond 2000 Solid Waste Master Plan by 2010. Implementing the recommendations in this report will help the MWRA Chelsea facility move toward meeting the requirements of Executive Order No. 438.

- **Improve the Environment**

Recycling benefits the environment in a number of ways:

- Conserving Natural Resources - By substituting scrap materials for the use of trees, metal ores, and other virgin materials, recycling reduces the need to expand forestry and mining operations.
- Saving Energy - Because recycled materials have already been processed once, it takes less energy to process new products with recycled material than virgin materials.
- Reducing Green House Emissions - Much of the energy used in industrial processes and in transportation of materials involves burning fossil fuels like gasoline, diesel, and coal, which are sources of greenhouse gas emissions. By saving energy, recycling also reduces the amount of greenhouse gasses being generated by these processes.

Using recycled vs. virgin materials to make new products saves a tremendous amount of energy and dramatically reduces harmful emissions. The following chart illustrates the benefits of using recycled vs. virgin pulp to make new paper

Paper 	60% energy savings (Center for Ecological Technology)	95% less air pollution; each ton saves 60 lbs. of air pollution (Center for Ecological Technology)	Recycling of each ton of paper saves 17 trees and 7000 gallons of water (EPA)
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- **Sustain Local Industries and Jobs**

Information obtained from the Massachusetts Department of Environmental Protection shows that the economic activity generated by the recycling and re-use industry in Massachusetts is significant. Highlights include:

- 1,437 recycling and reuse establishments.
- 19,445 employed in recycling and re-use industries.
- \$557 million in annual payroll.
- \$3.58 billion in annual revenues.

Current Program Overview

The following chart provides an overview of the existing MWRA waste management contracts for the Chelsea facility:

Contract	Payment Structure	Annual Contract Cost	Qty Managed	Cost per Ton ***
Trash	End of Griffen Way: \$130 pickup fee (30-yd container, 2xs/month) – contains mostly bulky waste from maintenance activities. Disposal charge (\$88/ton)	\$3,120 \$8,334	94.7 tons	\$121
	2 Griffen Way: \$650 monthly charge (10-yd container, 3xs/week). 130 yds max/month – contains mostly trash from the maintenance and shop areas.	\$7,800	*	
	3 Griffen Way: \$1075 monthly charge (10-yd container, 5xs/week). 210 yds max/month – contains mostly trash from the office building.	\$12,900	*	
	Total	\$32,154		
Tires	Picked up on call as needed	\$900	550 tires/yr	N/A
Waste Oil	Picked up on call as needed	\$0	2300 gal/yr	N/A
White Paper	\$92.00 Monthly charge; 5-toters, once/wk	\$1,104	**	N/A
Fluorescent Lamps	Picked up on call as needed	\$1,500	1100 bulbs	N/A
Batteries, Lead Acid Dry	Picked up on call as needed	Included with fluorescent lamps	1300 batteries	N/A
Batteries, Alkaline	Picked up on call as needed	Included with fluorescent lamps	125 batteries	N/A
	Totals	\$35,658		

* Flat fee charged; emptied by front load trash truck; not weighed.

** Flat fee charged; emptied by recycling truck; not weighed.

*** The cost per ton includes per ton disposal expense, container rental, and pickup expense.

Summary of Major Recommendations Based on our research and site visit findings, the following is a list of major opportunities to improve waste management at the Chelsea facility:

Short term-

- Expand the current paper recycling program from white only to a sorted office mix.
- Establish a cardboard recycling program.
- Establish a comprehensive public education program.

Long term-

- Establish a bottle and can recycling program
- Establish a scrap metal recycling program

These recommendations are explained in detail on the following commodity pages.



RECYCLING MIXED OFFICE PAPER

Current Paper Recycling Program:

Browning Ferris Industries (BFI) provides the paper recycling service for the MWRA. BFI supplies five 96-gallon totes to the MWRA to collect the waste paper. These totes are placed in central office areas by the MWRA for employee use. A flat fee of \$92.00 per month is charged for the collection service.

Specific Recommendations:

WasteCap obtained a quote from Office Paper Recovery Systems, a vendor on state contract, for mixed paper recycling. OPRS will provide as many totes as needed and recycle mixed office paper for a total cost of \$25 per month. BFI currently charges \$92 per month to recycle only white office paper in only 5 totes.

WasteCap recommends that the MWRA contract with OPRS to recycle their mixed office paper. They will save \$67 per month in rental fees alone. Potential savings are greater in the future because when paper recycling rates increase, the MWRA will probably be able to reduce the number of times the trash dumpster is emptied per week, saving additional dollars.

WasteCap highly suggests that the MWRA switch to the sorted office mix recycling program as soon as possible. Switching to a mixed paper system eliminates the need for staff to separate white paper from other materials and captures more material for recycling, thereby reducing trash disposal costs.

- **Place desk-side recycling bins at each workstation**

Providing desk side recycling containers (usually 14 quart blue bins) within arm's reach of each workstation will dramatically improve paper recycling rates. Desk side recycling bins are convenient – and convenience is the key to a successful recycling program. MWRA employees presently have to walk to central bins to recycle. This system is inconvenient and results in low recycling rates. The paper recycling containers are critical to the success of the program because approximately 80% of typical office waste is recyclable paper.

Be sure to include an educational recycling flyer with each bin.

- **Place larger paper recycling bins at high generation areas**

Place 23 gallon Slim Jim containers with slotted tops manufactured by Rubbermaid (or equal) in areas such as the copy rooms, computer centers, and mailrooms where significant quantities of paper are generated. Recycling guidelines and trashcans should be placed in these areas to minimize contamination. (*See Appendix 2, which provides information about "Slim Jim" containers.*)

- **Add additional recycling bins if needed**

Monitor how full the recycling containers are before each time they are emptied. A tracking sheet will help you gauge the amount of times the containers actually need to be emptied. You can work with BFI to have them supply more bins, or purchase your own bins.

- **Collect recyclables from workstations on Tuesdays and Thursdays**

MWRA does not need to increase their workforce to implement an office paper recycling program and increase recycling rates. Instead of collecting trash every day, direct custodial staff to remove trash from offices three days a week and recyclables from offices twice a week. For example, use Monday, Wednesday, and Friday as trash pickup days and Tuesdays and Thursdays for recyclables pickups. Trash in bathrooms and other public spaces can still be collected daily.



The sign above the recycling container reads "white paper only". BFI confirmed that mixed paper is allowed in the containers.

General Paper Recycling Tips:

- Office paper usually comprises greater than 80% of office trash, so make your recycling program as or more convenient than the trash collection program.
- Recycle as many types of office paper as possible - the market for mixed office paper is good and is expected to remain so into the foreseeable future. Work with your vendor to include colored and white paper, newspapers, magazines, junk mail, envelopes, and post-it notes in your program
- Provide color-coded, clearly labeled recycling containers (usually 14 quart blue bins), within arm's reach of every desk, workstation, classroom, and conference room.
- Post clear and concise recycling guidelines adjacent to all recycling containers and on your company's website.
- Consider purchasing wheeled recycling carts (64 gallon carts work well) for bulk collection of recyclable paper rather than leasing them from vendors. The payback period is short and they are a good investment. Be sure to purchase containers that are compatible with your recycling vendor's equipment.
- Work closely with your recycling vendor regarding which materials are accepted and prohibited.
- Obtain service and price quotes from other vendors on an annual basis to ensure you are recycling as many materials as possible at the best rates available.
- Include a recycling manager's name and contact information on all posters, recycling containers, and program information.
- Recycling office paper reduces your environmental liability because recyclable paper is prohibited from disposal in landfills and incinerators through the Massachusetts Waste Ban regulations (visit <http://www.state.ma.us/dep/recycle/files/wstban01.doc>)
- **Remember - recycling more paper enables you to avoid trash disposal costs and helps you save \$\$.**

RECYCLING CARDBOARD

Current Cardboard Recycling Program:

Currently, the MWRA does not have a cardboard recycling program. All cardboard is disposed of in trash dumpsters.

Specific Recommendations:

- **Institute a cardboard recycling program**

WasteCap recommends that the MWRA begin a cardboard recycling program as soon as possible.

Cardboard takes up a significant amount of volume in the trash, and is a key reason that trash dumpsters require more frequent hauls, resulting in increased trash disposal fees. The facilities garage manager at the MWRA indicated that her facility disposed of a significant amount of cardboard, which was confirmed on the site visit.



Cardboard was observed in a trash barrel at the MWRA warehouse.

WasteCap obtained the following quotes from two vendors to install a 10 cubic yard lockable cardboard recycling dumpster with a slot at the MWRA facility and a new quote for the existing MWRA 10 cubic yard trash dumpster located outside the warehouse:

BFI 10 cubic yard cardboard recycling dumpster rental and recycling fees	
Emptied 1 x per week	\$150 /month
Emptied 2 x per week	\$260 /month
Emptied 3 x per week	\$400 /month

Save That Stuff 10 cubic yard cardboard recycling dumpster rental and recycling fees	
Emptied 1 x per week	\$100 /month
Emptied 2 x per week	\$260 /month
Emptied 3 x per week	\$400 /month

BFI 10 cubic yard trash dumpster outside warehouse (includes disposal fees)	
Emptied 5 x per week (current service)	\$1075 /month
Emptied 3 x per week	\$620 /month
Emptied 2 x per week	\$425 /month
Emptied 1 x per week	\$230 /month

WasteCap recommends that the MWRA install a 10 cubic yard lockable cardboard recycling dumpster with a slot from Save That Stuff emptied 1 time per week at an additional cost of \$100/month. MWRA should then decrease the number of times the BFI trash dumpster adjacent to the warehouse is emptied from the current 5 times per week to 3 times per week . This scenario will save the MWRA \$355 per month.

If the MWRA would rather obtain the cardboard recycling dumpster from their current vendor BFI, they will still save \$305 per month. The cardboard recycling dumpster should be placed adjacent to the existing warehouse trash

dumpster for convenience. The slot will require staff to break down boxes before sliding them into the locked container, and prevent the dumpster from being filled with trash.

General Cardboard Recycling Tips:

- Recycle cardboard whenever possible - recycling costs less than throwing it away, and cardboard takes up a significant amount of space in your trash dumpster.
- Insist that your vendor clearly labels your dumpsters and compactors "Recycled Cardboard Only".
- To minimize the number of pickups or hauls required, maximize the size of the cardboard dumpster or compactor used and encourage staff to flatten cardboard.
- Explore the possibility of changing your contract from an automatic pickup contract (e.g. 2 times/week) to an "on-call" contract where your staff calls for a pickup or haul only when the cardboard recycling container is full.
- If you are using a compactor, make sure the vendor installs a pressure gauge and provides you with the maximum pressure level allowed. Call for a haul only when the pressure is at or near this level, minimizing the number of hauls required.
- Recycling cardboard reduces your environmental liability because cardboard is prohibited from disposal in landfills and incinerators through the Massachusetts Waste Ban regulations (visit <http://www.state.ma.us/dep/recycle/files/wstban01.doc>).
- If you are using a dumpster, insist that your vendor provides one that is lockable and is equipped with a slot. These features will ensure the cardboard is flattened and contamination is kept to a minimum
- Obtain service and price quotes from other vendors on an annual basis to ensure you are recycling as many materials as possible at the best rates available
- **Remember - Recycling cardboard enables you to avoid trash disposal costs and helps you save \$\$.**

RECYCLING BOTTLES AND CANS

Current Bottle Recycling Program:

The MWRA does not currently recycle bottles and cans, although some MWRA employees have set up recycling bins to collect deposit containers.

Specific Recommendations:

- **Consider bottle and can recycling a long-term goal**

Because bottles and cans do not make up a significant portion of the MWRA's waste stream, the following recommendations should be used in long-term planning. WasteCap recommends focusing on improving and implementing paper and cardboard recycling procedures first.

- **Establish a bottle and can recycling program**

Plastic, glass, tin, and aluminum bottles and cans occupy a significant amount of volume in trash dumpsters and compactors, especially at companies housing cafeterias and other food services operations, so recycling them helps reduce trash disposal costs. It is estimated that bottles and cans may account for 2% by weight (more by volume) of your waste stream.



- Recycling these bottles and cans reduces your environmental liability because these materials are prohibited from disposal in landfills and incinerators through the Massachusetts Waste Ban regulations (visit <http://www.state.ma.us/dep/recycle/files/wstban01.doc>).
- The MWRA should use “Slim Jim” containers (or equal) with lids containing restrictive round holes to collect bottles and cans for recycling at high generation sites including break areas, cafeterias, and near existing trash containers. The Slim Jim containers can then be emptied by custodians into 96 gallon Toters for recycling by BFI.

(See Appendix 2, which provides information about “Slim Jim” containers.)

General Bottle and Can Recycling Tips:

- Consider purchasing wheeled recycling carts (96 gallon carts work well) for bulk collection of recyclable bottles and cans rather than leasing them from vendors. The payback period is short and they are a good investment. Be sure to purchase containers that are compatible with your recycling vendor's equipment.
- Search for a vendor that recycles co-mingled (mixed) plastic, glass, tin, and aluminum containers. This method is far easier than recycling the various materials separately.
- Work closely with your recycling vendor to determine which materials are accepted and prohibited.
- Obtain service and price quotes from other state contract vendors on an annual basis to ensure you are recycling as many materials as possible at the best rates available.
- Post clear and concise recycling guidelines adjacent to all recycling containers and on your company's website.
- Include a recycling manager's name and contact information on all posters, recycling containers, and program information.
- **Remember - recycling bottles and cans enables you to avoid trash disposal costs and helps you save \$\$.**

RECYCLING SCRAP METAL

Current Scrap Metal Program:

The MWRA does not currently recycle scrap metal. All scrap metal is disposed of in waste dumpsters.

Specific Recommendations:

- **Establish a scrap metal recycling program**

There are opportunities at the MWRA to recycle scrap metal. A significant amount of mixed recyclable scrap metal is generated in the vehicle repair and machine shops consisting of iron, steel, copper, aluminum, brass, and other metals. This mix is usually best recycled as “mixed light and heavy iron and steel”.

BFI charges a standard fee for scrap metal container rental and hauling. Depending on the types of metal received, BFI can refund the MWRA 50% of the rebate they receive from their material dealer.

In order to obtain more revenue from scrap metal recycling, the MWRA should consider dealing directly with scrap recyclers instead of going through BFI. WasteCap suggests obtaining quotes from various vendors for a scrap metal recycling container for mixed light and heavy iron and steel.

View WasteCap’s Recycling Services Directory (RSD) online at www.wastecap.org to find detailed information about scrap metal recyclers in the area. The RSD lists companies that accept, collect, and purchase materials for recycling from businesses.



Scrap metal, like this, observed in the MWRA's warehouse trash will cost far less to recycle than dispose of in the trash.

WASTE REDUCTION EDUCATION

Public education is critical to the success of your program. If this aspect of the program is not implemented, the recycling program will not reach its full potential. The best way to ensure a successful program is to educate the staff by explaining what is recyclable, where it can be recycled, why it is important to recycle, and who can answer questions about the recycling program.

Signage

Occupants must see clear, visible signs promoting the recycling program. Signs should be placed in high visibility areas such as bulletin boards, on or near recycling bins, near copy machines, in cafeterias (tri-fold table tents work well), and on the web (see the "Website" section below for details).

List what can be recycled and where it can be placed. Be sure to leave contact information for participants to ask questions or to report a problem. Information explaining your recycling program should also be included as part of the orientation for new employees.

To avoid contamination make sure all recycling bins and dumpsters are properly labeled.

Recycling Coordinators (Green Team)

Establish a network of volunteer recycling coordinators from each department or building. These networks have been proven to increase recycle rates and reduce costs. Many organizations have found that employees provide creative ideas to improve waste-handling practices. Management can make them feel comfortable and encourage them to come forward with ideas through the use of these networks.

By creating a network of coordinators you will develop a sense of program "ownership". These people will become your liaisons for distributing educational materials, and assist in the enforcement of their recycling programs.

Include representatives from the custodial work force in the network - you will find that many custodial staff take pride in the recycling efforts. They are also the people that deal with the program first-hand and probably know its strengths and weaknesses better than anyone.

Meet with the coordinators two to four times a year to discuss your recycling program. Use these meetings to share ideas to improve, expand, and sustain the program. Provide food at the meetings! It really helps increase attendance and participation.

Website

Create a section on your company website that outlines the recycling program. This section should contain guidelines and statistics that inform your staff and visitors about materials that can be recycled, where they should be placed, updates, statistics, and who to contact if they have questions about your recycling program.

By establishing a recycling section on your website, you will be providing an updateable resource for staff to print out anytime. The Web is also a great way to show visitors and the local community that your company is doing its part to improve the environment.

The address of your Website recycling section should be included on all recycling program educational materials.

Kick-off Memo

A letter signed by upper management and sent to company staff highlighting the benefits of the recycling program is an excellent way to jumpstart and enhance your program.

Reinforcement and Follow-up

It is important to reinforce the new recycling culture in your company. Keep employees informed of your company's recycling efforts by highlighting recycled products purchased, participation rates, quantities of recycled material collected, revenue earned, disposal cost savings, and any problems encountered and/or solved in company memos or newsletters. Continuously seek suggestions for improving your program from your staff.

Join the US EPA WasteWise Program

WasteWise is a free, voluntary, US Environmental Protection Agency (EPA) program through which organizations eliminate costly solid waste, benefiting their bottom line and the environment. Members set feasible and cost-effective waste management goals for their organization.

WasteWise provides free technical assistance to help your company develop, implement, and measure waste reduction activities. WasteWise offers publicity for organizations that are successful in reducing waste through EPA publications, case studies, and national and regional events. These events also provide networking opportunities for organizations to share waste reduction ideas and success stories.

(See Appendix 3 for more information.)

TRACKING RECYCLING STATISTICS

It is important to track your recycling and trash statistics on a regular basis. Maintaining accurate and consistent records including the types and quantities of materials recycled and disposed of in your program provides the basis for making informed decisions about future program modifications and enhancements.

- **Gauge Program Progress**

Tracking your waste reduction efforts will provide a consistent means to accurately measure and track the program progress over time and most importantly, it will help determine if your program is cost effective.

- **Address Waste Reduction Goals**

Accurately tracking your waste and recycling percentages will give MWRA the knowledge needed to set firm waste reduction goals.

- **Educate the Staff**

Information gathered from measuring and tracking recyclables and trash quantities is very valuable in educating your staff about the positive impacts of your program and sustaining the program.

Tracking Methods

The best way to track your recycling program's progress is to develop an electronic spreadsheet based on a monthly timeline which compares this year's recycling and trash totals to the previous year's totals. You can obtain this data from your trash and recycling service providers, and the information you need is often provided on monthly vendor invoices. Sample spreadsheet formats are provided below:

Z Corp Recycling Statistics

Commodity	Tons Generated									
	January		February		March		...	Year to Date Totals		
	FY03	FY04	FY03	FY04	FY03	FY04		FY03	FY04	% Change
Mixed paper										
Cardboard										
Bottles and Cans										
Scrap metal										
Total recyclables										
Trash										
Total recyclables and trash										

Commodity	Cost/Revenue									
	January		February		March			Year to Date Totals		
	FY03	FY04	FY03	FY04	FY03	FY04	...	FY03	FY04	% Change
Mixed paper										
Cardboard										
Bottles and Cans										
Scrap metal										
Total recyclables										
Trash										
Total recyclables and trash										

RESTRUCTURING EXISTING CONTRACTS

There are many ways to restructure your existing contract and reduce your waste disposal costs. Two methods are reviewed in this section.

Analyzing the number of Pulls or Dumps Required

Many times dumpsters or roll off containers are emptied too frequently, resulting high trash disposal and recycling costs. You should monitor the how full the recycling and trash containers are immediately before each time they are emptied. Create a weekly spreadsheet, which includes inspection times (the day that the dumpster or roll off container is to be emptied), as well as boxes indicating how full the container is at the time of inspection. You can use simple terminology such as “empty”, “1/4 full”, “full”, etc. By reviewing this tracking sheet over time, it will help you gauge the amount of times the container actually needs to be emptied. You may discover that the container needs to be emptied much less often —and that will translate into cost savings.

Example:

	% full on recycling or disposal day					Average % of total volume full/week
	Mon	Tue	Wed	Thu	Fri	
Date	10/6	10/7	10/8	10/9	10/10	
Dumpster, Building A - Mixed office paper (5 x week)	25%	25%	50%	25%	25%	30%
Roll off Building B – Trash (3 x week)	50%		50%		100%	67%

Resource Management

The Massachusetts Department of Environmental Protection's preferred method of contracting for waste management services is called resource management. Unlike traditional solid waste service contracts, resource management (RM) compensates waste contractors based on performance in achieving your organization's waste reduction goals rather than the volume of waste disposed. As a result, RM aligns waste contractor incentives with your own goals as you both explore innovative approaches that foster cost-effective resource efficiency through prevention, recycling, and recovery.

Coined by General Motors Corporation (GM), RM was a logical outgrowth to its success with performance-based contracting in the area of chemical purchasing, use, and management. GM adopted RM in response to an internal waste reduction goal and the recognition that existing hauling and disposal contracts limited waste reduction efforts across its more than 70 North American facilities. GM's objective in executing RM contracts was to "provide a systems approach to resource efficiency that motivates cost reduction and conservation of plant resources."

Research to date demonstrates that RM is widely applicable in business, institutional, and municipal settings. Because many organizations rely on disposal contracts and some already use performance-based contracting practices, RM might be a useful model for your organization.

For more information about RM, please visit the Massachusetts DEP's RM web site at <http://www.state.ma.us/dep/recycle/files/rm/rmcontr.htm>.